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IS 7599-2 (1975): General Requirements for Engineer's Comparators With Stand, Part II: Comparator Standard [PGD 25: Engineering Metrology]

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Indian Standard

(Reaffirmed 2006)

GENERAL REQUIREMENTS FOR ENGINEER'S COMPARATORS WITH STAND

PART II COMPARATOR STAND

Engineering Metrology Sectional Committee, EDC 43; Gauges Subcommittee, EDC 43 : 3 [Ref : Doc : EDC 43 (2488) F 1]

1. Scope — Covers the requirements of comparator stands used with engineer's comparators having magnification factors of 250 and over. The requirements of the comparators are covered in Part I of this standard.

2. Nomenclature — For the purpose of this standard the nomenclature as given in Fig. 1 shall apply.

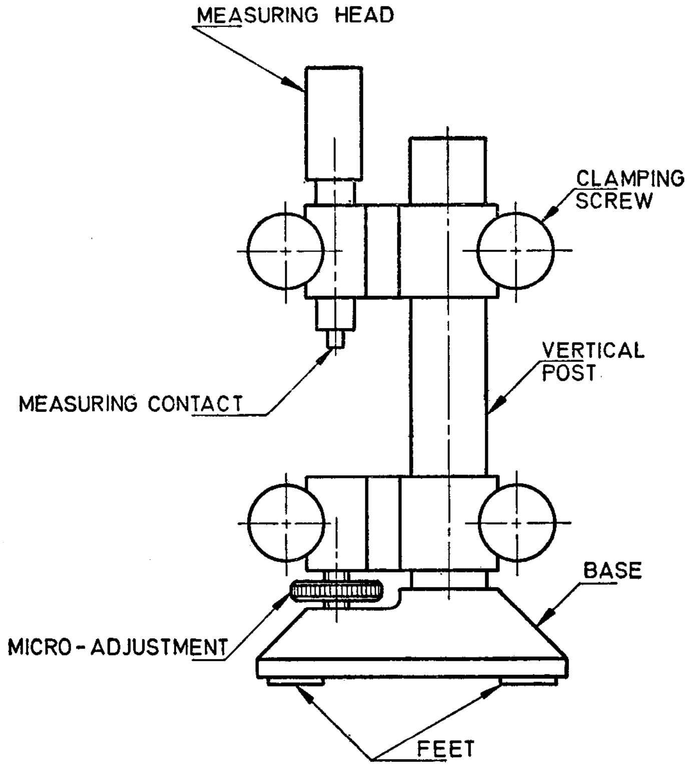

FIG. 1 NOMENCLATURE FOR ENGINEER'S COMPARATORS

3. General Requirements

3.1 The stand shall be of rigid construction and of first class workmanship throughout. The stiffness of the bracket covering the measuring head shall be governed by the provisions in **4**. Attention also should be paid to the method of supporting work table.

3.2 The base shall be of rigid construction and be provided with three feet. The base should provide a ready means of interchanging the work tables.

3.3 For the accommodation of work within the capacity of the instrument, both coarse and fine adjustments shall be provided for the measuring head, which shall be smooth in operation. The coarse adjustment shall be provided with a means of preventing free falling movement of the measuring head in the unclamped condition.

3.4 After coarse adjustment has been operated and clamped, the fine adjustment provided shall be such as to permit the instrument being set without difficulty to within one-tenth of one scale division. Should there be any risk of the fine adjustment being disturbed in the operation of the comparator, it shall be provided with a clamping device which will not disturb the zero setting.

Adopted 29 January 1975

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3.5 It is desirable to provide a means of adjusting the relative position of the measuring contact and table and for clamping this adjustment, in such a way as to ensure that the setting is maintained when adjusting the measuring head for the accommodation of the work within the capacity of the instrument.

3.6 The instrument shall be provided with effective means of preventing damage to it in the event of the measuring contact being raised abnormally or being suddenly released.

3.7 *Work Table*

3.7.1 The work table shall be made of steel, hardened over its working surface to 850 *HV, Min* (65 *HRC* approximately) (*see* IS : 1501-1968 Method for Vickers hardness test for steel) or an alternative material of comparable wear resisting properties. After hardening, the work table shall be suitably heat-treated to give stability.

3.7.2 The work surface shall be provided with grooves and be finished by lapping, and shall be flat to within 1·5 μm for a comparator having a magnification factor of 600 or less; 0·75 μm for a comparator having a magnification factor of above 600 and up to 10 000; and 0·35 μm for a comparator having a magnification factor greater than 10 000.

3.7.3 Any departure from flatness shall be such as to give a convex configuration (*see* Fig. 2).

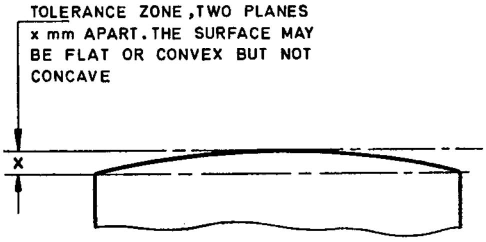
TOLERANCE ZONE ,TWO PLANES x mm APART. THE SURFACE MAY BE FLAT OR CONVEX BUT NOT CONCAVE
x

FIG. 2 FLATNESS TOLERANCE

3.7.4 The upper and lower surfaces of the work table shall be parallel to within 0·1 mm.

3.7.5 The following alternative styles of work table are also allowed :

a) With tungsten carbide inserts,

b) Flat without grooves,

c) Widely spaced lands,

d) Non-magnetic (granite) and

e) Circular (various diameters).

4. Accuracy — The deflection of the bracket carrying the measuring head, ΔV shall be within the following when a load of 100 g is applied at the end of the bracket (*see* Fig. 3):

$$\Delta V = \frac{V}{2\,500} + 0{\cdot}22$$

where

V = capacity of the instrument.

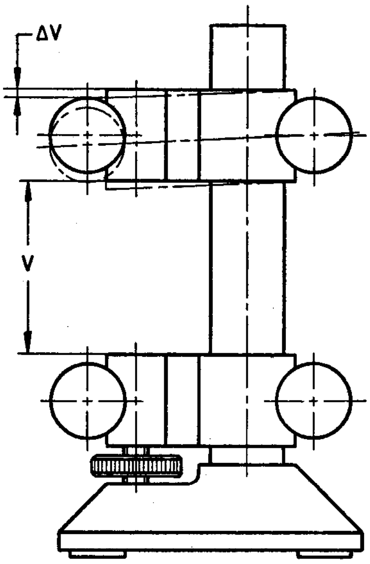

FIG. 3 TESTING FOR STIFFNESS OF BRACKET

5. Packing — The stand shall be packed according to the best trade practices prevalent in the country.

6. Marking — Each stand shall be marked with the maker's name or recognized trade-mark, and with a serial number.

EXPLANATORY NOTE

This standard has two parts. Part I covers details about the comparators while Part II covers details about the comparator stand.

In the preparation of this standard assistance has been derived from BS 1054 : 1954 " Engineer's comparators for external measurement " and draft BS 73/33653 " Specification for engineer's mechanical comparators for external measurement " issued by the British Standards Institution.

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